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FAX Cover Sheet

Date:	10/11/06
From:	Mark Vande Pol
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Pages to follow:	8

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Date: 10/8/06

To: Ella Colbert

Mark Edward Vande Pol
25150 Mountin Charlie Rd.
Los Gatos, CA 95033-8320

Re: Application/Control Number: 09/819,159

Dear Ms. Colbert,

I've been doing the physical work of habitat restoration for fifteen years. My invention is not an investment algorithm, but a way of managing elements of natural habitat that renders them into economic assets, thereby inducing a market that can, over decades, greatly reduce the need for government regulation where appropriate. Its certification process is not about auditing monetary value, but audits actual contracted practices in the field. The insurance is not for the investment, but to restore pre-existing conditions (or better) should a process or experiment fail. This invention has nothing to do with Hoffman, political control, or Sustainable Development as noted in the cited prior art.

My invention is a business model that gradually accounts the objective value of ecosystem resources: plants, animals, fungi, bacteria, soil mechanics, hydrological properties... as a part of the conduct of more usual industrial operations such as timber, ranching, farming, construction, or mining. That accounting renders associated process elements and subsystems into **ecosystem assets** that deliver economically valuable services: whether erosion control, recreational and scenic value, research experiments to reduce the cost and improve the performance of habitat restoration projects and equipment, or processes that offset industrial and urban environmental impacts.

This invention organizes the elements identified in the disclosure into the simple structure necessary to manage complexity. The full application explains the rationale for and operation of

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each component, including necessary checks and balances. Together, the structural components produce a motivational architecture, where superior resource management is rewarded.

An operator under this system collects validated data to characterize the function of ecosystem assets and maintains financial records by which to account their financial replacement cost. All data is certified by an insured third party. Reliable information then becomes available to insurers of existing assets such that they can estimate the cost of replacing assets at risk. The process information becomes marketable for its ability to assure successful restoration projects to offset the impacts of industrial, commercial, and residential activities.

Proposed applications of the invention in the full disclosure suggest specific pilot programs with which to address complex environmental problems, many of which have eluded effective solutions under existing rule systems: timber and fire management near residential development, exotic species control, pesticide management, restoring populations of endangered species, and managing sources and sinks of non-point water pollution.

By comparison, government environmental regulation suffers from both motivational and structural problems. The power to either specify regulations or visit selective enforcement is power for sale to the politically dominant, a magnet for corruption by which to bankrupt one's competitors or force production overseas. Many tax-exempt, private foundations, operating supposedly in the name of "charity," instead, use grant money to induce regulations that provide a market advantage to their owners. The claims of activists and scientists subsisting off that funding are rarely held to account for the unintended consequences of resulting institutional bias, while bureaucracies are allocated more funding when problems get worse.

Most people agree that centralized government planning implementing uniform policies in a non-uniform world is structurally unsuited to manage enormously complex and rapidly changing markets. Natural habitat is far more complex than an economy; it "transacts" on so

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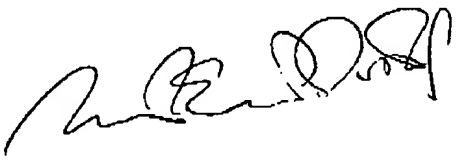
many levels that we have only very basic understanding of how it works. Worse, the unintended consequences of government regulation are enacted on an enormous scale, making enormous mistakes inevitable. MTBE on gasoline contaminated groundwater and caused asthma nationwide. Kudzu was imported for erosion control and ruined 27 million acres of southeastern forests. Mandated mulching for erosion control resulted in 22 million acres of starthistle. Fire suppression accumulated 190 million acres of catastrophic fuel loads in forests and rangeland, abetted massive pest infestations, and causes horrendous erosion problems after the resulting catastrophic fires. No private entity is capable of such an enormous impact.

This invention bootstraps economic value into previously unrecognized assets on a scale limited to private property. It justifies a free market in services to managing natural process with three levels of insurance to correct mistakes, superior to regulatory oversight. That competitive market will push our ability to manage complex interactions by motivating invention of new technology at lower cost. This invention has nothing to do Hoffman's algorithm for analyzing existing cash flow for investment in a Brownfield. This method serves to generate that cash flow and business opportunity that Hoffman's "invention" could then evaluate.

Attached is an illustrative example. If you want an item-by-item response to the rejection letter, please let me know. Please reconsider this application,



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Re: Illustrative Example re Application/Control Number: 09/819,159

Soil is an **ecosystem asset,** as are things that grow in it. Humanity cannot sustain life without soil. Streambed down-cutting is a primary cause of soil erosion. To reduce or even reverse streambed down-cutting in a seasonal watercourse, the inventor conducted an **experimental process** as follows:

The State prohibits commercial thinning along streams supposedly to prevent erosion. The inventor cut trees along said watercourse, thus **deviating from standard commercial timber processes** required under State permit (no timber was sold or milled in this experiment; it was therefore non-commercial tree thinning; similarly, thinning along streams would also violate the State's new proposed canopy specifications). The wood was carefully wedged into the channel in patterns designed to trap sediments. Thinning allowed penetration of additional light on an alluvial deposit adjacent to the stream that promoted the growth of Santa Barbara Sedge (*Carex barbarae* – a native plant). This sedge has excellent sediment filtration and erosion resistance properties. After two years of establishment for the sedge, the inventor dropped a dead tree into the stream, diverting it over the sedge to see if it could withstand the flow. It worked like a charm, surviving the largest flow in 50 years with no damage.

If this experiment had been the commercial ecosystem process development as the inventor proposes, there would now be a contractual opportunity to develop a validated process to reduce down-cutting and retain sediment. Those contracts would contain **conformance**

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specifications, by which to meet **performance specifications** by which to establish whether contracted results were achieved.

This inventor has documented his experiment for three years and invited periodic review by responsible third parties, a form of **concurrent validation**. The inventor has invited independent third-party observation of the results, a form of independent **retrospective validation** and **third-party verification**. That verified data could then justify Board of Forestry permission to extend the replication to experimental forests that are within its powers to designate (the CEO of that Board has expressed interest in the experiment).

A **natural process description** should include ranges for the amount of light, soil characteristics, rainfall, or competing species with lesser attributes, symbiotes, etc. that *Carex barbarae* requires. Conformance specifications would include the necessary stand density by which to adsorb intermittent runoff, the maximum time the plant could survive under water, etc. in a manner similar to process settings with tolerances for an industrial process. Such descriptions are derived from **data from the operation and monitoring of the experiment compared to controls and repetitions**.

Control experiments compare the process described above in locations having similar conformation that don't receive the treatment used in the experiment, while replications repeat the steps to see if similar results are achieved. It is validation of the data that produces reliable means to compare inputs and outputs of each trial on similar bases. To extend the concept, one could organize such samples to form a factorial array of properties participating in the experiment simultaneously, testing the ranges of a number of variables.

To posit a control case, if the dead tree that was used to divert the water in the experiment would have fallen "naturally," but *without* prior thinning of the forest, there would have been no previously established sedge. Lacking the hard root bed and slick surface sedge can provide, the

diverted water would have rutted a new channel through the alluvium. Without thinning, there would have been no sedge to provide filtration of sediments. Controls providing validated data could thus confirm the hypothesis that government specifications for 85% or greater canopy would have precluded the sedge from developing and would instead have CAUSED massive erosion when that tree fell "naturally" (which takes the root ball with it, causing a hole in the slope called "pit and mound" erosion). This is similar to the way fire suppression and burning regulations have induced massive fuel loads leading to catastrophic fires. Meanwhile, the cost of bureaucracy resulting from those regulations has helped consolidate the timber market into corporate hands, just as similar regulations have done for over thirty years.

The **process description** in this method is the first step that contains predictive information: if specified inputs are provided and actions taken, specified results will be attained within understood tolerances and with actuarially anticipated risks (should unanticipated events cause deviations outside anticipated ranges). When such a product has an insured guarantee is when information becomes reliable. That is when it becomes marketable.

Consider the owner of a dam downstream that doesn't want to have to dredge the reservoir, either because canopy regulations have induced landslides resulting from down-cutting or because fire suppression and logging regulations have induced un-natural fuel loads resulting in erosion subsequent to a catastrophic fire (such as happened to reservoirs containing the water supply for the City of Denver after the Hayman Fire). The financial data concerning thinning and re-establishing native groundcovers shows the economic worth of that service only so long as insurers are allowed to charge each individual according to the risks they assume, from which regulations currently "protect" both government agencies and insurance companies.

This experimental process, thinning the forest to add light to the floor to grow vegetation to reduce erosion, effectively established an ecosystem asset: sedge under a thinned canopy, as

having economic value. It characterized a process: modifying the canopy to provide suitable habitat for sedge. There is currently no understood economic worth to such a process, indeed, the cost of the bureaucracy to obtain a permit for commercial thinning (now at least $40,000) precludes such a process. To understand the return on investment, one has to have a decent estimate of the cost of the consequences (lacking the sedge) and the benefit of reducing the transport of sediment downstream. This method organizes that information.

By contrast, Hoffman's invention is about a computer program to analyze existing investments, not a habitat management system to create new investment assets. It may result in contracts for environmental services, but even these are industrial in nature (for example, incinerating contaminated soil). Hoffman is not directed toward managing ecosystem assets, such as manipulating soil mycorrhizae with vegetation to consume a contaminant; this management method eliminates the need for the Federal and State agency legal oversight that consumes 90% of the Superfund monies that were supposedly allocated to treat soil contamination.

When evaluating the posited product resulting from replications of the experiment above, any potential investor in such a service, such as Hoffman's clients, would need to know that the technical and financial data are represented honestly. Because of how this method is organized, the technical validation is already complete, to which one would add a certification that the cost data are also validated. The method proposed by this inventor specifies either service to be performed by an insured third party, just as Hoffman's investors would expect the books of the venture at interest to have been certified by an insured CPA. The reasons for this are structural (see Figure 1 of the original application), having to do with assuring that the technical process performs as represented.

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The cost of insurance to moderate risk-taking when allowed to price coverage by its objective cost, directs capital to those opportunities with the greatest promise, and directs it away from areas where risks and costs of restoration are high. That facilitates cleanup of damaged areas and inhibits development of pristine areas. It is the ability to discriminate in the price of insurance to cover the cost of risk that directs capital to those who are successful in process development. The inventor proposes a system of third-party verification enterprises using audit largely by means of instrumentation and insured to cover errors in that service. Were this patent allowed this inventor could use it to organize such a company, possibly creating an entirely new industry. Lacking the financial leverage of intellectual property, there has been no such interest. Without this alternative, we are stuck with the existing corrupt, inefficient, and counterproductive system.